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EXAMINER

HEINRICH, SAMUEL M

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HITOSHI KIDOKORO and MASATO MATSUBARA

Appeal 2009-005497
Application 10/517,656
Technology Center 3700

Before LINDA E. HORNER, MICHAEL W. O’NEILL, and
STEFAN STAICOVICI, *Administrative Patent Judges*.

STAICOVICI, *Administrative Patent Judge*.

DECISION ON APPEAL¹

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE

Hitoshi Kidokoro and Masato Matsubara (Appellants) appeal under 35 U.S.C. § 134 (2002) from the Examiner's decision finally rejecting under 35 U.S.C. § 103(a) claims 1, 3, and 5 as unpatentable over Yoshihide (JP 57-186378 A, publ. Nov. 16, 1982), Abe (JP 05-022941 A, publ. Jan. 29, 1993), Shimamura (JP 58-141689 A, publ. Aug. 23, 1983), and Yoshigaki (JP 07-111427 A, publ. Apr. 25, 1995); and claim 6 as unpatentable over Yoshihide, Abe, Shimamura, Yoshigaki, and Koo (JP 03-011904 A, publ. Jan. 21, 1991).² Claims 2 and 4 have been canceled. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

THE INVENTION

Appellants' invention relates to a laser machining apparatus and a control method for the apparatus in which the pulse width of the generated pulse laser beam can be varied by thinning-out command pulse sets 2 so as to change the switching number N of an inverter circuit 5 in the electrical power supply 3. Spec. 8:1-6; Spec. 9:10-12; and fig. 1.

Claim 1 is representative of the claimed invention and reads as follows:

1. Laser machining apparatus comprising:

² The Examiner refers to Yoshihide as "JP57186378A", to Abe as "JP405022941A", to Shimamura as "JP358141689A", to Yoshigaki as "JP407111427A" and to Koo as "JP403011904A." For the purpose of this appeal, we shall refer to the English language translations of the Yoshihide, Abe, Shimamura, Yoshigaki, and Koo references, which were made of record on Apr. 19, 2010.

a control means for outputting command pulse sets according to control [parameter settings] for controlling laser pulse output power;

a thinning-out means, into which the command pulse sets are inputted, for switching a number of pulses thinned out from the command pulse sets, according to a pulse width setting of the control parameters

an electric power supplying means for generating, in response to command pulse sets outputted from the thinning-out means, pulsed electric power supplied to a load; and

a generating means for pumping, to output a laser beam, a laser medium with which a discharging space is filled, by means of discharge generated by the pulsed electric power supplied from the electric power supplying means.

SUMMARY OF DECISION

We REVERSE.

ANALYSIS

The Examiner found that Yoshihide discloses a laser device controlled by thinning out or proportioning a power pulse train. Ans. 4. The Examiner further found that each of Abe, Shimamura, and Yoshigaki discloses “providing pulse train modulation in response to desired outputted pulse width.” Ans. 5-6. According to the Examiner, Abe describes “cost reduction by pulse modulating in response to pulse width,” and Shimamura and Yoshigaki “describe control for motor and volume control using pulse trains controlled in response to pulse width.” Ans. 4. The Examiner then concluded that:

Having a power source output a pulse train and being controlled by pulse width would have been obvious at the time applicant's invention was made to a person having ordinary skill in the art in order to reduce operation cost.

Id.

At the outset, we agree with the Examiner that Yoshihide discloses a laser device controlled by a thinned-out power pulse train. Specifically, we find that the pulse count controlled waveform of Yoshihide shown in Figure 4(c) exhibits portions where it is less dense and portions where it is more dense, hence is thinned-out. Yoshihide, P. 4. However, the laser output in Yoshihide is proportional to the pulse count and not to the pulse width, as called for by each of independent claims 1 and 5. Yoshihide, P. 5. Hence, we agree with Appellants that in contrast to the claimed invention, which requires setting the number of pulses in accordance with a desired output laser pulse width, Yoshihide discloses setting the number of pulses (pulse count) in accordance with the strength of the laser power output. *See App. Br. 9.*

With respect to the disclosures of Abe, Shimamura, and Yoshigaki, we agree with the Examiner that each reference discloses the use of pulse width modulation. *See Ans. 4.* Specifically, it is our finding that: (1) Abe uses pulse width modulation to control a converter without requiring an expensive multiplier (Abe, P. 4, para. [0005]); (2) Shimamura uses pulse width modulation to control the speed of a motor in such a manner that as the speed command becomes larger the pulse width becomes longer (Shimamura, P. 3); and (3) Yoshigaki uses pulse width modulation to control the output amplitude of an electronic volume device (Yoshigaki, P. 4 and 6-7, paras. [0006], [0010], and [0011]). However, we could not find any

portion in either Abe, Shimamura, or Yoshigaki, and the Examiner has not pointed to any portion, that discloses thinning out a number of command pulses based on an output pulse width setting, as called for in independent claims 1 and 5.

Furthermore, in rejecting claims under 35 U.S.C. § 103(a), the examiner bears the initial burden of establishing a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992); *see also In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). We find that the Examiner's explanation of the rejection consists of nothing more than a series of essentially unconnected discussions of selected teachings of references followed by a conclusory statement of obviousness. The determination as to whether there was an apparent reason to combine the known elements of Yoshihide, Abe, Shimamura, and Yoshigaki in the manner claimed requires an analysis regarding the teachings of Yoshihide, Abe, Shimamura, and Yoshigaki, and the knowledge of a person having ordinary skill in the art. However, the Examiner has not provided an analysis as to how the known elements of Yoshihide, Abe, Shimamura, and Yoshigaki would be combined in the manner called for in independent claims 1 and 5.

In conclusion, the combined teachings of Yoshihide, Abe, Shimamura, and Yoshigaki do not render obvious a laser system including a thinning-out means for thinning out the command pulse sets "according to a pulse width command of the control parameters," as called for by each of independent claims 1 and 5. Accordingly, the rejection of independent claims 1 and 5, and dependent claim 3, under 35 U.S.C. § 103(a) as unpatentable over Yoshihide, Abe, Shimamura, and Yoshigaki cannot be

sustained. *See In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim dependent therefrom is nonobvious).

With respect to claim 6, the addition of Koo does not remedy the deficiencies of Yoshihide, Abe, Shimamura, and Yoshigaki as described above. Therefore, the rejection of claim 6 under 35 U.S.C. § 103(a) as unpatentable over Yoshihide, Abe, Shimamura, Yoshigaki, and Koo likewise cannot be sustained.

SUMMARY

The decision of the Examiner to reject claims 1, 3, 5, and 6 is reversed.

REVERSED

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